REMARKS

Reconsideration and allowance are earnestly solicited. Claims 1, 2, 5-8, 10, 12, and 16 have been amended. Claims 1-18 are pending and at issue.

The Specification and claims 5, 6, 10, and 16 have been amended to correct the informalities identified by the Examiner.

Claim 1 has been amended to further clarify that the adjusting means is located at a single point on the press machine. Support for this amendment is found in the Specification at page 14, lines 18-20.

Claims 1, 7, and 16 have been amended to include two connecting rods. Support for this amendment is found in the Specification at page 12, lines 10-14.

Claims 2 and 7 have been amended to recite the proper antecedent basis.

Claims 6 and 12 have been amended to further clarify lengths (b) and (c) on the middle link. Support for this amendment is found in the Specification at page 15, lines 8-10 and in Figure 3.

Claim 8 has been amended to include a first linear guide and slider. Support for this amendment is found in the Specification at page 13, lines 22-23.

Claim 16 has been amended to further clarify the location of the center fulcrum point in relation to the first and second ends. Support for this amendment is found in the Specification at page 15, lines 8-11 and in Figure 3.

Objections to the Specification

The disclosure stands objected to as requiring correction of informalities. The Examiner points out that "fist" should be changed to "first" in claim 6, "pont" should be changed to "point" in claim 16, and "crank shaft" should be changed to "crankshaft" in claims 5, 10, and 16.

Claims 5, 6, 10, and 16 have been amended to correct the above informalities. Additionally, the specification has been amended at pages 5 and 9-10 to include the correct spellings of "first" and "point," respectively. The spelling of "crank shaft" has not been changed in the specification because of the numerous occurrences of this term.

Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 1-16 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite.

Regarding claim 1, the Examiner submits that the term "same location" is unclear. Claim 1 has been amended to further clarify that the adjusting means is located at a single point on the press machine. Therefore, this rejection is overcome.

Regarding claim 8, the Examiner submits that reference to a second linear guide and slider without reference to a first linear guide and slider renders this claim indefinite. Claim 8 has been amended to include reference to a first linear guide and slider. Therefore, this rejection is overcome.

Regarding claims 6 and 12, the Examiner submits that the second and third lengths of the middle link are unclear. Claims 6 and 12 have been amended to further clarify

that lengths (b) and (c) both describe distances on the middle link. Therefore, this rejection is overcome.

Regarding claim 16, the Examiner submits that lengths (b) and (c) from the center fulcrum point are unclear. Claim 16 has been amended to further clarify that length (b) is a distance located between the center fulcrum point and the first end, and length (c) is a distance located between the center fulcrum point and the second end. Therefore, this rejection is overcome.

Regarding claims 2 and 7, the Examiner submits that "said cycle" lacks antecedent basis. Claims 2 and 7 have been amended to remove references to "said cycle." Therefore, this rejection is overcome.

Rejections Under 35 U.S.C. § 102(b)

Claims 1-5 and 7-9 stand rejected under 35 U.S.C. § 102(b) as anticipated by Imanishi (U.S. Patent No. 5,848,568). According to the Examiner, Imanishi discloses a slide drive device comprising a slide with top and bottom dead center positions, an adjusting means, a driving means, a first upper link, a dynamic balancing means, a dynamic balancer, a guiding means, a first horizontal link, a crankshaft, a connecting rod, a first and second slider, and a first and second linear guide.

The rejection is respectfully traversed, and reconsideration is requested.

Amended claims 1 and 7 include the limitation of first and second connecting rods. In contrast, Imanishi discloses a device having only one connecting rod (13) (column 3,

line 65). There is no teaching or suggestion in Imanishi to a slide drive device having two connecting rods. Therefore, Imanishi cannot be relied upon to anticipate claims 1-5 and 7-9.

Rejections Under 35 U.S.C. § 103(a)

Claim 6 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Imanishi. The Examiner cites Imanishi as disclosing a first upper link, a first middle link, a fulcrum pin on the first middle link, and a third link. Although Imanishi does not disclose the relative lengths of the links as (a):(b) = (b):(c), the Examiner contends that such a relationship would have been obvious.

The rejection is respectfully traversed, and reconsideration is requested.

As discussed above, Imanishi discloses a slide driving device having only one connecting rod whereas claim 6 includes the limitation of two connecting rods. Imanishi does not disclose or suggest the use of two connecting rods. Moreover, the addition of a second connecting rod would necessitate a more complex device than that disclosed by Imanishi. A person having ordinary skill in the art would not have been motivated to increase the complexity of the device by adding a second connecting rod. Therefore, Imanishi cannot be relied upon to reject claim 6 as obvious.

Claims10-12 and 16-18 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Imanishi in view of Yoshida (U.S. Patent No. 6,148,720). The Examiner submits that Imanishi discloses a slide driving device that uses a crankshaft with an eccentric portion. Yoshida is cited as disclosing the use of a crankshaft having multiple eccentric

portions. According to the Examiner, it would have been obvious for one skilled in the art to have replaced the crankshaft of Imanishi with the multiple eccentric portion crankshaft of Yoshida to achieve the present invention.

The rejection is respectfully traversed, and reconsideration is requested.

As discussed above, Imanishi discloses a device having only one connecting rod whereas claims10 -12 and 16-18 recite the feature of two connecting rods. The addition of a second connecting rod increases the complexity of the Imanishi device. Thus, a person having ordinary skill in the art would not have been motivated to add a second connecting rod as in the present invention. Yoshida does not cure the deficiencies of Imanishi. Therefore, Imanishi, in view of Yoshida, cannot be relied upon to reject claims10-12 and 16-18 as obvious.

Allowable Subject Matter

The Examiner is thanked for indicating that claims 13-15 and 18 would be allowable if rewritten in independent form and to overcome the rejection under 35 U.S.C. § 112. Claims 13-15 and 18 remain in independent form, however, because base claims 7 and 16 and intervening claims 8, 10, and 12 have been amended to overcome their respective rejections.

Conclusion

It is believed, for the foregoing reasons, that the claims warrant allowance, and

such action is earnestly solicited.

If there are any other issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Respectfully submitted,

Louis J. DeJuidice
Reg. No. 47,522
Agent for Applicants

DARBY & DARBY, P.C.
Post Office Box 5257
New York, NY 10150-5257
Phone (212) 527-7700

EXPRESS MAIL CERTIFICATE

Date 1/10/03 Label No. EV 251493614 US

I hereby certify that, on the date indicated above, this paper or fee was deposited with the U.S. Postal Service & that it was addressed for delivery to the Assistant Commissioner for Patents, Washington, DC 20231 by "Express Mail Post Office to Addressee" service.

A. Stantini A. Stantini
Name (Print) Signature

PLEASE CHARGE ANY DEFICIENCY UP TO $300.00 OR CREDIT ANY EXCESS IN THE FEES DUE WITH THIS DOCUMENT TO OUR DEPOSIT ACCOUNT NO. 04-0100

Customer No.: 07278
PATENT TRADEMARK OFFICE

Docket No: 9637/0L310

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Shozo IMANISHI

Serial No.: 09/910,457 Art Unit: 3725

Confirmation No.: 1740

Filed: July 20, 2001 Examiner: Shelley M. SELF

For: **DRIVING DEVICE FOR A PRESS**

MARK UP TO ACCOMPANY RESPONSE TO OFFICIAL ACTION

IN THE SPECIFICATION:

Starting on page 5, line 5:

According to another embodiment of the present invention there is provided a slide drive device, further comprising: said at least first upper link having a first length (a), at least a first middle link, a center fulcrum pin on said first middle link, said first upper link operably connecting to said first middle link at said center fulcrum pin, a first and second end on said first middle link, said first [fist] connecting rod operably coupled to said second end,

said first middle link having a second length (b) from said first end to said center fulcrum pin, said first middle link having a third length (c) from said second end to said center fulcrum pin, and said first, second, and third lengths having the following relationship:

$$(a):(b) = (b):(c) \qquad (I)$$

whereby said first connecting rod transmits said driving displacement to said first [fist] upper link and said first middle link and driving means reduces a slide speed adjacent said bottom dead center position and increases said slide speed distal said bottom dead center position.

Starting on page 9, line 5 to page 10, line 5 :

According to another embodiment of the present invention there is provided a slide drive device, comprising: a crank shaft, at least a first eccentric part on said crank shaft, a second eccentric part on said crank shaft, said first and second eccentric parts operably opposing each other about a rotation center of said crank shaft, at least one of a first and second connecting rod, said one connecting rod operably joined to said one eccentric part, said one connecting rod receiving a driving displacement from said crank shafts, at least one of a first and second upper link, said one upper link operable about a fixed fulcrum pin, at least one of a first and second middle link, said one middle link having a first and second end, said one connecting rod effective to transfer said driving displacement to said one middle link at

said second end, said one upper link operably joined to said one middle link at a center fulcrum point between said first and second ends; said one middle link effective to transfer said driving displacement to said one upper link, said one middle link and said one upper link operably effective to transfer said driving displacement to a slide and drive said slide in a cycle, said one connecting rod having a having a length (a), said center fulcrum point a length (c) from said second end, said center fulcrum point [pont] a length (b) from said first end, and said lengths (a), (b), (c), having the following relationship:

(a):(b)=(b):(c) (III)

whereby said one connecting link operates horizontally to said crank shaft and said one upper link and said one middle link are effective to transfer said driving displacement to said slide and drive said slide in said cycle at a low speed adjacent said bottom dead center for increased force and a fast speed distal said bottom dead center for a speedier return.

IN THE CLAIMS:

1. (Amended) A slide drive device for a press machine, comprising:

a slide;

said slide including [includes] a top and a bottom dead center position;

an adjusting means for permitting adjustment of a stroke of said slide;

said adjusting means simultaneously adjusting said top and bottom dead center positions by a same amount; [and]

said adjusting means being located at a single point [the same location] on said press machine;

a crankshaft; and

first and second connecting rods on said crankshaft.

2. (Amended) A slide drive device, according to claim 1, further comprising:

a driving means for driving of said slide drive device;

at least a first upper link;

said first upper link being connected to drive said slide in a [said] cycle;

said driving means transmitting a driving displacement to said first upper link to drive said slide in said cycle; and

said means for driving transmitting said adjustment to said slide whereby said stroke is adjusted.

5. (Amended) A slide drive device, according to claim 4, further comprising:

[a crank shaft;

at least a first connecting rod on said crank shaft;]

said connecting rod receiving a reciprocating motion and transmitting said reciprocating motion to said means for driving;

said connecting rod and said means for driving being effective to transmit said reciprocating motion to said dynamically balancing means; and

said guiding means being effective to convert said reciprocating motion to a guiding displacement, whereby said slide operates in said cycle.

6. (Amended) A slide drive device, according to claim 5, further comprising:

said at least first upper link having a first length (a);

at least a first middle link;

a center fulcrum pin on said first middle link;

said first upper link operably connecting to said first middle link at said center fulcrum pin;

a first and second end on said first middle link;

said first [fist] connecting rod operably coupled to said second end;

said first middle link comprising [having] a second length (b) measured between [from] said first end and [to] said center fulcrum pin[;] , and a third length (c) measured between said second end and said center fulcrum pin; and

[said first middle link having a third length (c) from said second end to said

center fulcrum pin; and]

said first, second, and third lengths having the following relationship:

(a):(b) = (b):(c) (V)

whereby said first connecting rod transmits said driving displacement to said first [fist] upper link and said first middle link and driving means reduces a slide speed adjacent said bottom dead center position and increases said slide speed distal said bottom dead center position.

7. (Amended) A slide drive device for a press machine having a slide, comprising:

a slide;

said slide having a top and a bottom dead center position;

an adjusting means for adjusting a stroke of said slide;

said adjusting means simultaneously adjusting said top and bottom dead center positions by a same amount;

said adjusting means being located at the same location on said press machine;

a driving means for permitting driving of said slide drive device;

at least a first upper link;

said first upper link being connected to drive said slide in a [said] cycle;

said driving means transmitting a driving displacement to said slide to drive said slide in said cycle; [and]

said means for driving transmitting said adjustment to said slide whereby said stroke is adjusted;

a crankshaft; and

first and second connecting rods on said crankshaft.

8. (Amended) A slide drive device, according to claim 7, further comprising:

a guiding means for guiding of said slide drive device;

at least a first horizontal link;

first and [a] second linear guides [guide];

first and second sliders;

said [a] second slider operably slidable in said second linear guide;

said one horizontal link operably joined to said second slider;

said second slider receiving said driving displacement from said driving means;

said guiding means being effective to guide said adjustment to said slide; and

said first horizontal link driving said slide in said cycle whereby said stroke is adjusted and said top and bottom dead center positions are adjusted by the same amount.

10. (Amended) A slide drive device, according to claim 9, further comprising:

[a crank shaft;]

a center of said crankshaft [crank shaft] vertically aligned with said second slider;

at least one of a first and second eccentric part on said crankshaft [crank shaft];

said first and second eccentric parts diametrically opposed on said crankshaft [crank shaft];

said first and second eccentric parts balanced about a rotation center of said crankshaft [crank shaft];

said at least one connecting rod on said one eccentric part;

said connecting rod receiving a reciprocating motion and transmitting said reciprocating motion to said driving means;

said driving means being effective to transmit said reciprocating motion to said dynamically balancing means; and

a guiding means being effective to convert said reciprocating motion to a guiding displacement, whereby said slide operates in said cycle.

12. (Amended) A slide drive device, according to claim 11, further comprising:

at least a first upper link;

said first upper link operable about a fixed fulcrum pin;

said at least one upper link having a first length (a);

at least a first middle link;

a center fulcrum pin on said first middle link;

said first upper link pivotably joined to said one middle link at said center fulcrum pin;

a first and second end on said one middle link;

said one connecting rod operably coupled to said second end;

said one middle link comprising [having] a second length (b) [from] measured between said first end and [to] said center fulcrum pin[;] , and a third length (c) measured between said second end and said center fulcrum pin; and

[said one middle link having a third length (c) from said second end to said center fulcrum pin; and]

said first, second, and third lengths having the following relationship:

$$(a):(b) = (b):(c) \qquad (VI)$$

whereby said one connecting rod transmits said driving displacement to said first upper link and said first middle link and said driving means drives said slide in said cycle and reduces a slide speed adjacent said bottom dead center position and increases said slide speed distal said bottom dead center position.

16. (Amended) A slide drive device, for a press machine having a slide, comprising:

a crankshaft [crank shaft];

[at least] a first eccentric part on said crankshaft [crank shaft];

a second eccentric part on said crankshaft [crank shaft];

said first and second eccentric parts operably opposing each other about a rotation center of said crankshaft [crank shaft];

[at least one of] a first and second connecting rod;

said [one] connecting rods [rod] operably joined to said [one] eccentric parts [part];

said [one] connecting rods [rod] receiving a driving displacement from said crankshaft [crank shafts];

[at least one of] a first and second upper link;

said [one] upper links [link] operable about a fixed fulcrum pin;

[at least one of] a first and second middle link;

said [one] middle links [link] having [a] first and second ends [end];

said [one] connecting rods [rod] effective to transfer said driving displacement to said [one] middle links [link] at said second ends [end];

said [one] upper links [link] operably joined to said [one] middle link at a center fulcrum point between said first and second ends[.];

said [one] middle links [link] effective to transfer said driving displacement to

said [one] upper links [link];

said [one] middle links [link] and said [one] upper links [link] operably effective to transfer said driving displacement to a slide and drive said slide in a cycle;

said [one] connecting rods [rod having a] having a length (a);

said center fulcrum point located a length (c) from said second end;

said center fulcrum point located [pont] a length (b) from said first end; and

said lengths (a), (b), (c), having the following relationship:

(a):(b)=(b):(c) (VII)

whereby said [one] connecting rods operate [link operates] horizontally to said crankshaft [crank shaft] and said [one] upper links [link] and said [one] middle links [link] are effective to transfer said driving displacement to said slide and drive said slide in said cycle at a low speed adjacent said bottom dead center for increased force and a fast speed distal said bottom dead center for a speedier return.

EXPRESS MAIL CERTIFICATE 2514936 14 US

Date 1/10/03 Label No. EV

I hereby certify that, on the date indicated above, this paper or fee was deposited with the U.S. Postal Service & that it was addressed for delivery to the Assistant Commissioner for Patents, Washington, DC 20231 by "Express Mail Post Office to Addressee" service.

J. Stanton J. Stanton
Name (Print) Signature

PLEASE CHARGE ANY DEFICIENCY UP TO $300.00 OR CREDIT ANY EXCESS IN THE FEES DUE WITH THIS DOCUMENT TO OUR DEPOSIT ACCOUNT NO. 04-0100

Customer No.:

07278
PATENT TRADEMARK OFFICE

Docket No: 9637/0L310-US0

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Shozo IMANISHI

Serial No. 09/910,457 Art Unit: 3725

Confirmation No.: 1740

Filed: July 20, 2001 Examiner: Shelley M. SELF

For: **DRIVING A DEVICE FOR A PRESS**

PENDING CLAIMS AS OF JANUARY 10, 2003

January 10, 2003

Hon. Commissioner of
Patents and Trademarks
Washington, DC 20231

Sir:

1. (Amended) A slide drive device for a press machine, comprising:

a slide;

said slide including a top and a bottom dead center position;

an adjusting means for permitting adjustment of a stroke of said slide;

said adjusting means simultaneously adjusting said top and bottom dead center positions by a same amount;

said adjusting means being located at a single point on said press machine;

a crankshaft; and

first and second connecting rods on said crankshaft.

2. (Amended) A slide drive device, according to claim 1, further comprising:

a driving means for driving of said slide drive device;

at least a first upper link;

said first upper link being connected to drive said slide in a cycle;

said driving means transmitting a driving displacement to said first upper link to drive said slide in said cycle; and

said means for driving transmitting said adjustment to said slide whereby said stroke is adjusted.

3. A slide drive device, according to claim 2, further comprising:

dynamically balancing means for permitting dynamic balancing of said slide drive device;

a dynamic balancer operably connected to said slide;

said dynamically balancing means connected to said dynamic balancer;

said dynamically balancing means being operably connected to move said dynamic balancer opposite said slide in said cycle;

said means for driving connected to transmit said driving displacement to said dynamically balancing means; and

said dynamically balancing means moving said dynamic balancer opposite said slide in said cycle whereby said dynamic balancer operates to dampen vibration from said slide.

4. A slide drive device, according to claim 3, further comprising:

guiding means for guiding of said slide drive device;

at least a first horizontal link;

said first horizontal link operably connecting to said slide;

said guiding means guiding said first horizontal link in said cycle;

said driving means including said guiding means; and

said guiding means guiding said adjustment and said driving displacement to said slide whereby said stroke is adjusted.

5. (Amended) A slide drive device, according to claim 4, further comprising:

said connecting rod receiving a reciprocating motion and transmitting said reciprocating motion to said means for driving;

said connecting rod and said means for driving being effective to transmit said reciprocating motion to said dynamically balancing means; and

said guiding means being effective to convert said reciprocating motion to a guiding displacement, whereby said slide operates in said cycle.

6. (Amended) A slide drive device, according to claim 5, further comprising:

said at least first upper link having a first length (a);

at least a first middle link;

a center fulcrum pin on said first middle link;

said first upper link operably connecting to said first middle link at said center fulcrum pin;

a first and second end on said first middle link;

said first connecting rod operably coupled to said second end;

said first middle link comprising a second length (b) measured between said first end and said center fulcrum pin, and a third length (c) measured between said second end and said center fulcrum pin; and

said first, second, and third lengths having the following relationship:

$$(a):(b) = (b):(c) \qquad (V)$$

whereby said first connecting rod transmits said driving displacement to said first upper link and said first middle link and driving means reduces a slide speed adjacent said bottom dead center position and increases said slide speed distal said bottom dead center position.

7. (Amended) A slide drive device for a press machine having a slide, comprising:

a slide;

said slide having a top and a bottom dead center position;

an adjusting means for adjusting a stroke of said slide;

said adjusting means simultaneously adjusting said top and bottom dead center positions by a same amount;

said adjusting means being located at the same location on said press machine;

a driving means for permitting driving of said slide drive device;

at least a first upper link;

said first upper link being connected to drive said slide in a cycle;

said driving means transmitting a driving displacement to said slide to drive said slide in said cycle;

said means for driving transmitting said adjustment to said slide whereby said stroke is adjusted;

a crankshaft; and

first and second connecting rods on said crankshaft.

8. (Amended) A slide drive device, according to claim 7, further comprising:

a guiding means for guiding of said slide drive device;

at least a first horizontal link;

first and second linear guides;

first and second sliders;

said second slider operably slidable in said second linear guide;

said one horizontal link operably joined to said second slider;

said second slider receiving said driving displacement from said driving means;

said guiding means being effective to guide said adjustment to said slide; and

said first horizontal link driving said slide in said cycle whereby said stroke is adjusted and said top and bottom dead center positions are adjusted by the same amount.

9. A slide drive device, according to claim 8, further comprising:

dynamically balancing means permitting dynamic balancing of said slide drive device;

said dynamically balancing means connecting a dynamic balancer to said slide;

said dynamically balancing means connects to operate said dynamic balancer opposite said slide;

said dynamically balancing means receiving said guiding displacement; and

said dynamically balancing means being effective to operate said dynamic balancer opposite said slide whereby said dynamically balancing means and said dynamic balancer counter a momentive force of said slide in said cycle and substantially lower vibration in said slide drive device.

10. (Amended) A slide drive device, according to claim 9, further comprising:

a center of said crankshaft vertically aligned with said second slider;

at least one of a first and second eccentric part on said crankshaft;

said first and second eccentric parts diametrically opposed on said crankshaft;

said first and second eccentric parts balanced about a rotation center of said crankshaft;

said at least one connecting rod on said one eccentric part;

said connecting rod receiving a reciprocating motion and transmitting said reciprocating motion to said driving means;

said driving means being effective to transmit said reciprocating motion to said dynamically balancing means; and

a guiding means being effective to convert said reciprocating motion to a guiding displacement, whereby said slide operates in said cycle.

11. A slide drive device, according to claim 10, further comprising:

a small and a large end on said one connecting rod;

said large end operably attached to said one eccentric part;

said small end operably attached to said driving means; and

said small end reciprocating linearly to a rotation center of said crank shaft whereby said driving displacement is transmitted to said slide.

12. (Amended) A slide drive device, according to claim 11, further comprising:

at least a first upper link;

said first upper link operable about a fixed fulcrum pin;

said at least one upper link having a first length (a);

at least a first middle link;

a center fulcrum pin on said first middle link;

said first upper link pivotably joined to said one middle link at said center fulcrum pin;

a first and second end on said one middle link;

said one connecting rod operably coupled to said second end;

said one middle link comprising a second length (b) measured between said first end and said center fulcrum pin, and a third length (c) measured between said second end and said center fulcrum pin; and

said first, second, and third lengths having the following relationship:

$$(a):(b) = (b):(c) \qquad \text{(VI)}$$

whereby said one connecting rod transmits said driving displacement to said first upper link and said first middle link and said driving means drives said slide in said cycle and reduces a slide speed adjacent said bottom dead center position and increases said slide speed distal said bottom dead center position.

13. A slide drive device, according to claim 12, further comprising:

a guide pin;

said guide pin guiding said dynamic balancer opposite said slide;

a balancer pin;

said balancer pin operably joined to said dynamic balancer;

a balancer link;

said balancer link operably joining said balancer pin to said one connecting rod;

said balancer link receiving said driving displacement and transmitting said guiding displacement to said dynamic balancer whereby said dynamic balancer operates opposite said slide and substantially eliminates vibration; and

said dynamic balancing means having a shape adapted to said driving means whereby said slide drive device is compact in size.

14. A slide drive device, according to claim 13, wherein:

said balancer pin is vertically aligned with said fixed fulcrum pin

15. A slide drive device, according to claim 14, further comprising:

a first linear guide;

said first linear guide vertically aligned with said fixed fulcrum pin and said balancer pin;

a first slider operably slidable in said first linear guide;

said first end of said one middle link operably joined to said first slider;

said one middle link operably transmitting said driving displacement from said one connecting link to said first slider;

at least one of a first and second lower link;

a first and second side on said one horizontal link;

said first side operably joined to said second slider;

said second side operably joined to said one lower link;

said one lower link operably joining said first slider and said one horizontal link; and

said first slider being effective to convert said driving displacement to a linear displacement whereby said one lower link operably drives said one horizontal link and said slide in said cycle.

16. (Amended) A slide drive device, for a press machine having a slide, comprising:

a crankshaft;

a first eccentric part on said crankshaft;

a second eccentric part on said crankshaft;

said first and second eccentric parts operably opposing each other about a rotation center of said crankshaft;

a first and second connecting rod;

said connecting rods operably joined to said eccentric parts;

said connecting rods receiving a driving displacement from said crankshaft;

a first and second upper link;

said upper links operable about a fixed fulcrum pin;

a first and second middle link;

said middle links having first and second ends;

said connecting rods effective to transfer said driving displacement to said middle links at said second ends;

said upper links operably joined to said middle link at a center fulcrum point between said first and second ends;

said middle links effective to transfer said driving displacement to said upper links;

said middle links and said upper links operably effective to transfer said driving displacement to a slide and drive said slide in a cycle;

said connecting rods having a length (a);

said center fulcrum point located a length (c) from said second end;

said center fulcrum point located a length (b) from said first end; and

said lengths (a), (b), (c), having the following relationship:

$$(a):(b)=(b):(c) \qquad \text{(VII)}$$

whereby said connecting rods operate horizontally to said crankshaft and said upper links and said middle links are effective to transfer said driving displacement to said slide and drive said slide in said cycle at a low speed adjacent said bottom dead center for increased force and a fast speed distal said bottom dead center for a speedier return.

17. A slide drive device, according to claim 16, further comprising:

means for adjusting said slide drive device;

a top and a bottom dead center position of said slide;

said adjusting means permitting adjustment of a stroke of said slide;

said adjusting means permitting adjustment of said top and bottom dead center position at the same time;

said adjusting means permitting said adjustment of said top and bottom dead center positions by the same amount;

at least one of a first and second horizontal link;

a first and second end on said one horizontal link;

said one horizontal link effective to receive said driving displacement at said second end;

said one horizontal link effective to receive said adjustment at said first end; and

said one horizontal link effective to transfer said driving displacement and said adjustment to said slide whereby said slide is adjusted and driven in said cycle.

18. A slide drive device, according to claim 17, further comprising:

means for dynamically balancing said slide drive device;

said dynamic balancing means operably moving a dynamic balancer opposite said slide in said cycle;

a guide pin operably guiding said dynamic balancer during said cycle;

said guide pin vertically aligned with said fixed fulcrum pin;

said dynamic balancing means driven by said one connecting rod; and

said dynamic balancing means being effective to counter a momentive force of said slide and said one connecting rod whereby said slide operates in said cycle with substantially lower vibration.